

**CALSITHERM**

# Aluminium

Materials for Aluminium Casting



**Your Refractory Experts**



[www.calsitherm.com](http://www.calsitherm.com)

## CALCAST® CC 100–CC 450

CALCAST® is a ceramic insulation material based on calcium silicate suitable for the permanent application of up to 1000 °C. The material is asbestos-free and quartz-free. It is used in direct contact with liquid aluminium alloys for transport, distribution and flow control of the metal.

High compression and bending strength as well as excellent edge stability allow the precise fabrication of complex machined parts with high accuracy.

CALCAST® offers a range of specific characteristics, it is dimensionally stable and wear resistant.



### APPLICATIONS

CALCAST® is used to manufacture semi-finished products such as billets, ingots and pigs. In die-casting, e.g. for the manufacture of wheel rims, pistons and engine components, CALCAST® is used as feeder box, adapter lid, adapter tube and sprue nozzle. CALCAST® is also used as hot wall in holding and dosing furnaces and heated transport launders.

- Hot top rings
- Transition and header plates
- Floats
- Feeder boxes, adapter lids
- Feeders, adapter pipes, sprue nozzles
- Nozzles
- Stoppers
- Skim dams
- Furnace and launder linings



### SPECIAL CHARACTERISTICS

- Non-wetting by aluminium melt
- Thermal shock resistant
- Dimensionally stable
- Insulating, low heat capacity
- Precisely machinable
- High compression and bending strength
- Abrasion resistant
- High edge stability
- Quartz- and asbestos-free



	CC 100	CC 150	CC 350	CC 450
Classification temperature (°C)	1000	1000	1000	1000
Bulk density (kg/m <sup>3</sup> )	860	1040	1050	950
Cold compression strength (MPa)	14	20	28	27
Thermal conductivity $\lambda$ (W/mK) at $t_m$				
400 °C	0.24	0.25	0.25	0.24
800 °C	0.28	0.29	0.29	0.28
Chemical standard analysis (%) (CaO-; MgO-; Al <sub>2</sub> O <sub>3</sub> -) silicate	97.5–98	97.5–98	97.5–98	95–97
Dimensions (mm)				
thickness	12.7–101.6	12.7–101.6	12.7–101.6	12.7–76.2
length x width	500–3000 x 1250	500–3000 x 1250	500–3000 x 1250	500–3000 x 1250

## SILCAFUSE

**SILCAFUSE** is a fused silica with a ceramic bonding and a content of 98.5% SiO<sub>2</sub>. Parts are produced by slip casting. The components are heat treated up to 1000 °C and therefore dimensionally stable. They are non-wettable by non-ferrous alloys and free of crystalwater.

Due to low thermal expansion, **SILCAFUSE** is extremely resistant to temperature shocks; preheating prior to use is not required.

**SILCAFUSE 110-168** has a fine-grained particle structure. The material has a ceramic bonding and is fired at 1000 °C.

**SILCAFUSE 110-170** and **110-190** are hydraulically bonded with a coarse-grained structure and designed for higher wear resistance.

### APPLICATIONS

**SILCAFUSE** is used as launder for the metal transfer and as launder lining in casting tables. The launders are thin walled. The low mass and an effective backing insulation results in an excellent thermal insulation of the launder systems.

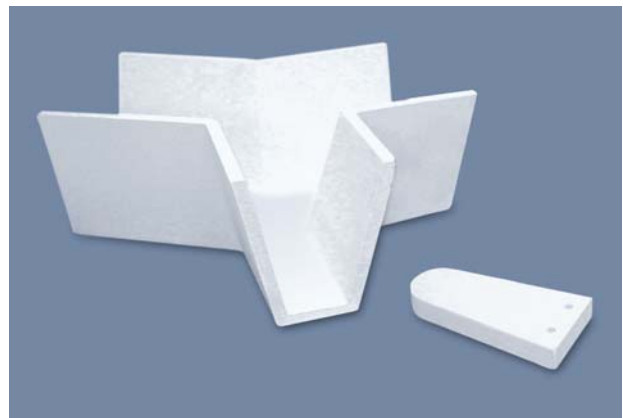
Also for large-sized sprue nozzles and nozzle inserts in pig systems, **SILCAFUSE** is the perfect choice due to high shock and abrasion resistance.

**SILCAFUSE** ladles insulate significantly better than metal ladles and maintenance is reduced tremendously due to the non-wetting properties. Hand spoons are used to avoid metal contamination.

Also as large-sized feeder box **SILCAFUSE** proves itself through a long life time.

### SPECIAL FEATURES

- Non-wetting with non-ferrous metals
- High thermal shock resistance
- Abrasion resistant and edge stability
- Outstanding insulation properties



	110-168	100-170	110-190
Classification temperature (°C)	1100	1000	1100
Bulk density (kg/m <sup>3</sup> )	1680	1700	1900
Cold compression strength (MPa)	29	20–40	20–60
Shrinkage length, width/thickness 4h at 650 °C	0/0	0/0	0/0
Thermal expansion (%) at 1000 °C	0.07	0.2	0.06
Thermal conductivity λ (W/mK) at t <sub>m</sub>			
400 °C	0.47	0.65	0.77
600 °C	0.49	0.73	0.84
Chemical standard analysis (%)			
CaO	1.4	< 6	< 0.6
SiO <sub>2</sub>	98.5	75	96–97
Al <sub>2</sub> O <sub>3</sub>	< 0.1	16	< 2.5

## SILCASIN-GPSN

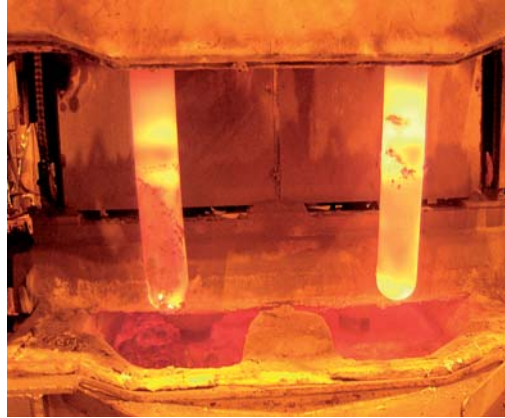
SILCASIN-GPSN is a gas-pressure sintered engineering ceramic based on silicon nitride ( $\text{Si}_3\text{N}_4$ ). Due to the gas-tight structure and high chemical resistance in aggressive media, the excellent thermal shock resistance and hardness results in an almost indestructible material for applications where contact with molten aluminium is present.

### APPLICATIONS

- Heating tubes
- Riser tubes
- Thermocouple shielding
- Alfine hooks

### SPECIAL FEATURES

- Non-wetting by liquid aluminium
- High thermal shock resistance
- Long lifetime, low maintenance



SILCASIN-GPSN	
Classification temperature (°C)	1200
Bulk density (kg/m <sup>3</sup> )	3210
Cold compression strength (MPa)	2500–3000
Thermal conductivity $\lambda$ (W/mK) at $t_m$ 20 °C	30
Material description $\text{Si}_3\text{N}_4$ gas pressure sintered silicon nitride Al/Y	

## SILCAL 1100, MICROCAL 1100, AND SILCAPOR ULTRA 950

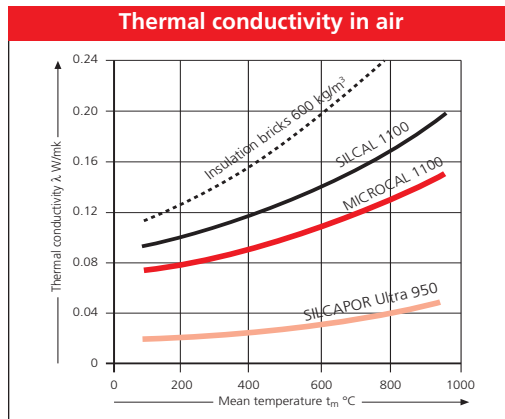
SILCAL 1100 and MICROCAL 1100 are environmentally-friendly, large-sized insulation boards based on calcium silicate. They provide, in combination with our micro-porous insulation material SILCAPOR Ultra 950, an up-to-date insulation system for backing insulation of furnaces and casting systems.

### APPLICATIONS

- Melting furnaces
- Holding furnaces
- Launders
- Transport crucibles

### SPECIAL FEATURES

- Environmentally-friendly
- Compression resistant, good machinability
- Large-sized, dimensionally stable
- Light-weight, excellent insulation properties



	SILCAL 1100	MICROCAL 1100	SILCAPOR Ultra 950
Classification temperature (°C)	1100	1100	950
Bulk density (kg/m <sup>3</sup> )	255	260	230
Cold compression strength (MPa)	1.6	1.2	1.26 (10 % compr./800 °C)
Thermal conductivity $\lambda$ (W/mK) at $t_m$			
400 °C	0.12	0.09	0.024
800 °C	0.17	0.13	0.040
Chemical standard analysis (%)			
CaO	46–47	36–38	80 (SiO <sub>2</sub> )
SiO <sub>2</sub>	44–45	45–47	15 (SiC)
Standard dimensions (mm)			
thickness	25–100	25–100	10–50
length x width	1250 x 500	1250 x 500	1000 x 650

## SILCACAST FILTERS

**SILCACAST filters** are high performance ceramic filters based on Mullite. Due to their outstanding properties, **SILCACAST filters** can be used for applications of up to 1480 °C and are suitable for cast aluminium and cast iron. Depending on requirement, pressed and extruded filter types from 50–300 csi are available. In addition, an economic production of filters tailored to customer needs is available.

### SPECIAL FEATURES

- For cast aluminium and cast iron max. 1480 °C
- High filter capacity up to 300 csi
- High thermal shock resistance
- High operation reliability

## AUXILIARY MATERIALS

We supply repair materials and coatings especially suitable for the contact with liquid aluminium. They are not wetted, reduce maintenance and have a long service life.

- SILCADUR mortar, adhesive, coating
- SILCAVAC repair kit Mastic
- Boron nitride- and Graphite coating

## HIGH-TEMPERATURE INSULATION

As experts for refractory light-weight construction technology we can offer a broad range of insulation material of up to 1800 °C. As your competent partner, we supply on request **"EVERYTHING FROM ONE SOURCE"**, also for furnace, plant and machine construction.

### Block Insulation max. 1100 °C

- SILCAMIN mineral wool boards
- SILCAPOR micro-porous insulation boards
- SILCAL and MICROCAL boards

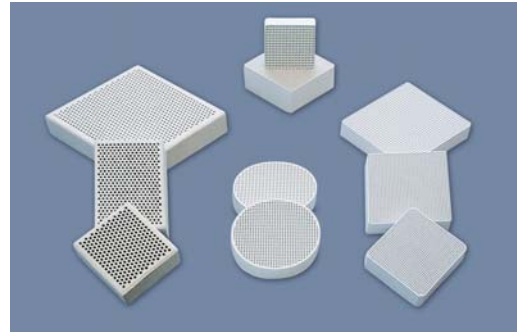
### Ceramic Fibre Products max. 1600 °C

- SILCAFLEX blankets, felts, papers, ropes
- SILCAPACK/SILCASTACK modular systems
- SILCABOARD boards
- SILCAVAC vacuum-moulded components
- SILCAFELT (self-adhesive) felts and die-cut parts

### Ceramic Fibre Substitute Material max. 1300 °C

- SILCAWOOL blanket, boards, papers, ropes
- SILCAVER glass fibre, tapes, cords
- SILCAWOOL (self-adhesive) paper, die-cut parts

The bio-soluble fibre products **SILCAWOOL** can replace conventional ceramic fibres to a widest extent. Thanks to modern production processes various types with a classification temperature of up to 1300 °C are available today. Please contact our engineering department.



Detailed information and technical data sheets are available from our homepage and as catalog.

The properties indicated in this brochure are typical values obtained in serial testing and determined by acknowledged test methods. Product-specific variations have to be taken into account. The information provided in this data sheet does not present guaranteed properties and cannot be used for any warranty claims.

# CALSITHERM

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